

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Previously Presented): An image processing device for generating modified image data by modifying color tones of an image in image data; comprising

a parameter candidate storage portion that stores a plurality of modification candidate parameters for modifying colors of pixels in image data, the plurality of modification candidate parameters corresponding to mutually differing modifications, and each of the plurality of modification candidate parameters corresponding to modification which converts tone values of a primary color in a color system into tone values of the same primary color, or modification which converts tone values of lightness into tone values of lightness;

a user interface portion that allows a user to select parameters from among the plurality of modification candidate parameters; and

an image converting portion that generates modified image data according to the selected parameter from subject image data that is subject for modification of color tones in image, wherein the modified image data is different from the subject image data in colors of at least part of pixels; wherein

the plurality of modification candidate parameters includes:

N_c color image modification candidate parameters for color image data, where N_c represents a number that is a positive integer, and

N_m monochrome image modification candidate parameters for monochrome images, where N_m represents a number that is an integer larger than N_c ; and

the user interface portion

allows the user to select a parameter from the N_c color image modification candidate parameters in case where the subject image data is color image data; and

allows the user to select a parameter from the N_m monochrome image modification candidate parameters in case where the subject image data is monochrome image data.

Claim 2 (Canceled).

Claim 3 (Original): An image processing device according to Claim 1, further comprising:

a conversion curve preparing portion that prepares according to the selected parameter a conversion curve for producing modification of colors of pixels, the conversion curve providing output tone values corresponding to input tone values,

when the subject image data is monochrome image data, the user interface portion provides a partial adjustment input screen for modifying a second part of the conversion curve without modifying a first part of the conversion curve, the first part being a part in which the input tone values are within a specific range,

the image processing device further comprises a conversion curve modifying portion that modifies the second part of the conversion curve according to user instructions through the partial adjustment input screen, and

the image converting portion produces tone values for pixels of the modified image data by modifying tone values of pixels of the subject image data based on the conversion curve .

Claim 4 (Original): An image processing device according to Claim 3, wherein the second part is a part corresponding to an area of the input tone values, the area being included in a range of up to top 40% of scope of the input tone values.

Claim 5 (Original): An image processing device according to Claim 3, wherein the second part is a part corresponding to an area of the input tone values, the area being included in a range of up to bottom 25% of scope of the input tone values.

Claim 6 (Previously Presented): An image processing device according to Claims 4 or 5 wherein the conversion curve modifying portion modifies the conversion curve so that change in the output tone value of the conversion curve is within a range of ± 10 when expressed as the "L*" in an "L*a*b*" color coordinate system.

Claim 7 (Previously Presented): An image processing device according to Claims 4 or 5 further comprising:

a medium type input portion that receives information about a type of print medium for printing image of the subject image data; and

a modification range determining portion that determines according to the information about the type of the print medium an allowable range of modifications of the output tone values of the conversion curve by the conversion curve modifying portion; wherein

the conversion curve modifying portion modifies the conversion curve so that sizes of the changes in the output tone values of the conversion curve are within the allowable range.

Claim 8 (Original): An image processing device according to Claim 3, wherein the conversion curve modifying portion modifies the second part of the conversion curve so that a highest value in scope of the input tone values is converted into a lower value than a highest value in scope of the output tone values.

Claim 9 (Original): An image processing device according to Claim 3, wherein the conversion curve modifying portion modifies the second part of the conversion curve so that a lowest value of in scope of the input tone values is converted into a higher value than a lowest value in scope of the output tone values.

Claim 10 (Original): An image processing device according to Claim 3, wherein
the monochrome image data is image data in which brightness of each pixel is expressed by a tone value,
the image processing device further comprises a conversion table generating portion that generates a monochrome image conversion table according to the conversion curve when the subject image is monochrome image data;

the monochrome image conversion table is a conversion table for converting the monochrome image data into image data expressed by tone values in a specific first color coordinate system, wherein conversion with the monochrome image conversion table converts at least a part of achromatic colors expressed by tone values into colors with different brightnesses; and

the image converting portion converts the subject image data into the modified image data based on the monochrome image conversion table when the subject image data is monochrome image data.

Claim 11 (Previously Presented): An image processing device according to Claim 10, wherein

the color image data is image data in which color of each pixel is expressed by tone values in a second color coordinate system,

the conversion table generating portion generates a color image conversion table according to the conversion curve when the subject image data is color image data;

the color image conversion table is a conversion table for converting the color image data into image data expressed by tone values in a third color coordinate system that is different from the second color coordinate system, wherein conversion with the color image conversion table modifies at least part of colors expressed by the tone values in the second color coordinate system into other colors;

the image converting portion converts the subject image data into the modified image data based on the color image conversion table when the subject image data is color image data;

the third color coordinate system is a color coordinate system in which tone values can be any of M_c mutually differing values, where M_c represents a number that is a positive integer; and

the first color coordinate system is a color coordinate system in which tone value can be any of M_m mutually differing values, where M_m represents a number that is an integer larger than M_c .

Claim 12 (Original): An image processing device according to Claim 10, wherein the monochrome image conversion table is a conversion table that includes a part in which, when colors are expressed in an “ $L^*a^*b^*$ ” color coordinate system, the “ L^* ” value of a color that is modified according to the conversion curve is incremented linearly relative to increments in the input tone value that expresses color prior to modification.

Claim 13 (Previously Presented): A method for generating modified image data by modifying color tones of an image in image data comprising steps of:

(a) selecting a parameter from a plurality of modification candidate parameters for modifying colors of pixels in image data, the plurality of modification candidate parameters corresponding to mutually differing modifications, and each of the plurality of modification candidate parameters corresponding to modification which converts tone values of a primary color in a color system into tone values of the same primary color, or modification which converts tone values of lightness into tone values of lightness; and

(b) generating modified image data according to the selected parameter from subject image data that is a subject for modifications of color tones in image, wherein the modified image data is different from the subject image data in colors of at least part of pixels, wherein, the plurality of modification candidate parameters includes:

Nc color image modification candidate parameters for color image data, where Nc represents a number that is a positive integer; and

Nm monochrome image modification candidate parameters for monochrome images, where Nm represents a number that is an integer larger than Nc;

the process (a) includes:

(a1) selecting the parameter from the Nc color image modification candidate parameters in case where the subject image data is color image data; and

(a2) selecting the parameter from the Nm monochrome image modification candidate parameters when the subject image data is monochrome image data; and

each step of the method for generating modified image data by modifying color tones of an image in image data is executed by a microprocessor.

Claim 14 (Previously Presented): A method according to Claim 13, further comprising:

(c) preparing according to the selected parameter a conversion curve for producing modification of colors of pixels, the conversion curve providing output tone values corresponding to input tone values,

the step (a) further includes

providing to a user a partial adjustment input screen for modifying a second part of the conversion curve without modifying a first part of the conversion curve, when the subject image data is monochrome image data, the first part being a part in which the input tone values are within a specific range,

the method further comprising

(d) modifying the second part of the conversion curve according to user instructions through the partial adjustment input screen, and

the step (b) includes producing tone values for pixels of the modified image data by modifying tone values of pixels of the subject image data based on the conversion curve.

Claim 15 (Original): A method according to Claim 14, wherein

the step (d) includes modifying the second part of the conversion curve so that a highest value in scope of the input tone values is converted into a lower value than a highest value in scope of the output tone values.

Claim 16 (Original): A method according to Claim 14, wherein

the step (d) includes modifying the second part of the conversion curve so that a lowest value of in scope of the input tone values is converted into a higher value than a lowest value in scope of the output tone values.

Claim 17 (Previously Presented): A computer program product for generating modified image data using a computer by modifying color tones of an image in image data comprising:

a computer-readable storage medium; and

a computer program that is stored on the computer-readable storage medium, wherein the computer program is capable of achieving on a computer:

a function for allowing a user to select a parameter from a plurality of modification candidate parameters for modifying colors of pixels in image data, the plurality of modification candidate parameters corresponding to mutually differing modifications, and each of the plurality of modification candidate parameters corresponding to modification which converts tone values of a primary color in a color system into tone values of the same primary color, or modification which converts tone values of lightness into tone values of lightness; and

a function for generating modified image data according to the selected parameter from subject image data that is a subject for modifications of color tones in image, wherein the modified image data is different from the subject image data in colors of at least part of pixels, wherein

the plurality of modification candidate parameters includes:

Nc color image modification candidate parameters for color image data, where Nc represents a number that is a positive integer, and

Nm monochrome image modification candidate parameters for monochrome images, where Nm represents a number that is an integer larger than Nc; and

on the computer, the computer program is further capable of:

allowing the user to select the parameter from the Nc color image modification candidate parameters in case where the subject image data is color image data; and

allowing the user to select the parameter from the Nm monochrome image modification candidate parameters in case where the subject image data is monochrome image data.

Claim 18 (Original): A computer program product according to Claim 17, wherein

the computer program is further capable of preparing according to the selected parameter a conversion curve for producing modification of colors of pixels on the computer, the conversion curve providing output tone values corresponding to input tone values,

the function for allowing the user to select a parameter includes

a function for providing to the user a partial adjustment input screen for modifying a second part of the conversion curve without modifying a first part of the conversion curve, when the subject image data is monochrome image data, the first part being a part in which the input tone values are within a specific range,

on the computer, the computer program is further capable of achieving a function for modifying the second part of the conversion curve according to user instructions through the partial adjustment input screen, and

the function for generating modified image data includes a function for producing tone values for pixels of the modified image data by modifying tone values of pixels of the subject image data based on the conversion curve.

Claim 19 (Original): A computer program product according to Claim 18, wherein
the function for modifying the second part includes a function for modifying the
second part of the conversion curve so that a highest value in scope of the input tone values is
converted into a lower value than a highest value in scope of the output tone values.

Claim 20 (Original): A computer program product according to Claim 18, wherein
the function for modifying the second part includes a function for modifying the
second part of the conversion curve so that a lowest value of in scope of the input tone values
is converted into a higher value than a lowest value in scope of the output tone values.